

Atty. Dkt. No. 068904-0501

## THE CLAIMS

The status of all claims is given below.

1-24 (Cancelled)

25. (Original) A method for preparing a heavy chain binding protein array in eukaryotic cells, comprising the steps of:

(a) transforming a population of eukaryotic cells with a library of at least two different polynucleotides, wherein each polynucleotide encodes a different heavy chain binding protein (ChBP) polypeptide that:

(i) comprises an amino acid sequence that is at least 75% identical to a constant region tailpiece of a mu or alpha chain of a native immunoglobulin heavy chain;

(ii) comprises multiple combining sites, wherein all of the combining sites satisfy the same one of the following requirements:

(1) at least 75% identity to a 25 consecutive amino acid portion of an immunoglobulin light chain variable region; or

(2) at least 75% identity to a 25 consecutive amino acid portion of an immunoglobulin heavy chain variable region; and

(iii) either (1) specifically binds to a ligand with a  $K_D < 10^{-6}$  moles/liter; or (2) forms one or more disulfide bonds with one or more polypeptides in the transfected cell, to generate a ChBP that specifically binds to a ligand with a  $K_D < 10^{-6}$  moles/liter; and

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(b) growing the transformed cells on a medium that permits assembly of a C<sub>H</sub>BP, wherein each C<sub>H</sub>BP comprises at least four combining sites;

and therefrom preparing a C<sub>H</sub>BP array in eukaryotic cells.

26. (Original) A method according to claim 25, wherein the polynucleotides encode immunoglobulin alpha or mu chains.

27. (Original) A method according to claim 25, wherein the cells are further transformed with one or more polynucleotides encoding polypeptides having sequences that are at least 75% identical to a sequence of an immunoglobulin J chain.

28. (Original) A method according to claim 25, wherein each C<sub>H</sub>BP is assembled from four alpha chains and one J chain.

29. (Original) A method according to claim 25, wherein each C<sub>H</sub>BP is assembled from twelve mu chains.

30. (Original) A method according to claim 25, wherein each C<sub>H</sub>BP is assembled from ten mu chains and at least one J chain.

31. (Original) A method according to claim 25, wherein the C<sub>H</sub>BP or components thereof further comprise one or more portions of immunoglobulin molecules selected from the group consisting of J chains, secretory components and light chain constant regions.

32. (Original) A method according to claim 25, wherein the cells are plant cells.

33. (Original) A method according to claim 25, wherein the cells are insect cells.

34. (Original) A method according to claim 25, wherein the cells are mammalian cells.

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## Claims 35-37 (Cancelled)

38. (Currently amended ) A method according to claim ~~25 or claim~~ 35, wherein the library comprises at least 10 different polynucleotides.
39. (Currently amended ) A method according to claim ~~25 or claim~~ 35, wherein the library comprises at least 100 different polynucleotides.
40. (Currently amended ) A method according to claim ~~25 or claim~~ 35, wherein the library comprises at least 1000 different polynucleotides.
41. (Currently amended ) A method according to claim ~~25 or claim~~ 35, wherein the library comprises at least 10,000 different polynucleotides.
42. (Currently amended ) A method according to claim ~~25 or claim~~ 35, wherein the polynucleotides encode polypeptides that retain at least 95% amino acid identity to a constant region tailpiece of a mu or alpha chain of a native immunoglobulin heavy chain.
43. (Currently amended ) A method according to claim ~~25 or claim~~ 35, wherein the step of transforming is performed via *Agrobacterium*-mediated transformation, chemically-induced DNA uptake, electroporation, solid particle intrusion, biolistics, microinjection, macroinjection, lipofection or viral infection.
44. (Currently amended ) A method according to claim ~~25 or claim~~ 35, wherein the binding proteins accumulate in an intracellular compartment of the cells.
45. (Currently amended ) A method according to claim ~~25 or claim~~ 35, wherein the binding proteins are secreted from the cells.
46. (Currently amended ) A method according to claim ~~25 or claim~~ 35, wherein the plant cells are dicotyledonous plant cells.

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47. (Original) A method according to claim 46, wherein the plant cells are tobacco or Arabidopsis plant cells.
48. (Currently amended ) A method according to claim ~~25~~ or claim 35, wherein the plant cells are monocotyledonous plant cells.
49. (Original) A method according to claim 48, wherein the plant cells are corn, Lemna or rice plant cells.
50. (Currently amended ) A method according to claim ~~25~~ or claim 35, wherein the plant cells are lower plant cells.
51. (Original) A method according to claim 50, wherein the plant cells are green algae cells.
52. (Original) A method according to claim 51, wherein the plant cells are *Chlamydomonas reinhardtii*.
53. (Original) A ChBP array in eukaryotic cells, comprising at least two eukaryotic cells that are each transformed with a different polynucleotide encoding at least one ChBP polypeptide that:
- (a) comprises an amino acid sequence that is at least 75% identical to a constant region tailpiece of a mu or alpha chain of a native immunoglobulin heavy chain;
  - (b) comprises multiple combining sites, wherein all of the combining sites satisfy the same one of the following requirements:
    - (i) at least 75% identity to a 25 consecutive amino acid portion of an immunoglobulin light chain variable region; or
    - (ii) at least 75% identity to a 25 consecutive amino acid portion of an immunoglobulin heavy chain variable region; and

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(c) either (i) specifically binds to a ligand with a  $K_D < 10^{-8}$  moles/liter; or (ii) forms one or more covalent bonds with one or more polypeptides in the transfected cell, to generate a ChBP that specifically binds to a ligand with a  $K_D < 10^{-6}$  moles/liter; and

(d) differs in amino acid sequence from other ChBPs in the array;  
wherein the cells assemble ChBPs comprising at least four combining sites.

54. (Original) A binding protein array according to claim 53, wherein the polynucleotides encode polypeptide components of immunoglobulin molecules independently selected from the group consisting of heavy chains and fragments thereof, light chains and fragments thereof, J chains and secretory components.

55. (Original) A binding protein array according to claim 53, wherein the cells are plant cells.

56. (Original) A binding protein array according to claim 53, wherein the cells are insect cells.

57. (Original) A binding protein array according to claim 53, wherein the cells are mammalian cells.

58. (Original) A binding protein array according to claim 55, wherein the plant cells are selected from the group consisting of corn, rice, Lemna, tobacco and *Chlamydomonas*.

59. (Original) A binding protein array according to claim 53, wherein at least 10 different binding proteins are assembled by the cells in the array.

60. (Original) A binding protein array according to claim 53, wherein at least 100 different binding proteins are assembled by the cells in the array.

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61. (Currently amended ) A binding protein array according to claim 53, wherein at least ~~400~~ 1,000 different binding proteins are assembled by the cells in the array.

62. (Original) A binding protein array according to claim 53, wherein at least 10,000 different binding proteins are assembled by the cells in the array.

63. (Original) A binding protein array according to claim 53, wherein each cell within the array is transfected with at least two different polynucleotides, each encoding a different C<sub>H</sub>BP component, such that each cell assembles a functional C<sub>H</sub>BP comprising the C<sub>H</sub>BP components.

Claims 64-66 (Cancelled)

67. (New) A binding protein array according to claim 55, wherein the plant cells are dicotyledonous plant cells.

68. (New ) A binding protein array according to claim 55, wherein the plant cells are monocotyledonous plant cells.

69. (New) A binding protein array according to claim 53 wherein each C<sub>H</sub>BP component comprises a variable region from a light chain.

70. (New) A binding protein array according to claim 53 wherein each C<sub>H</sub>BP component comprises a variable region from a heavy chain.

71. (New) A binding protein array according to claim 53 wherein said at least one C<sub>H</sub>BP polypeptide comprises at least four combining sites